The Results of Understanding social and spatial dynamics in bicycle use in the randstad and its policy implications

Knowledge gaps and research objectives
Due to its high mode share of cycling, the Netherlands serves as inspiration for those that aspire to stimulate cycling elsewhere. There is however little insight into thereasons that caused Dutch cities to have such a high cycling share, and more particularly which policy interventions or which combinations of interventions have contributed to stimulating cycling and which have not. Furthermore, knowledge on spatial and social variations in cycling patterns and cycling trends is lacking as well.This lack of knowledge into cycling patterns, cycling trends, and the effectiveness of cycling policy seriously limits the potential for learning from Dutch cycling and for developing effective policies based on these. In order to fill this gap, this research has explored the spatial and social differentiation of cycling patterns and trends in the Netherlands. In addition, it has explored the performance of Dutch cycling policy based on the efforts of 22 medium-sized cities since 2000.

Spatial and social differences and trends
Mobility diaries from the Dutch National Travel Survey (NTS) allowed us to distinguish trends in mobility behaviour across different spatial contexts and social groups.Our findings revealed three important spatial and social differences in cycling patterns and trends. First, the spatial redistribution of the population towards urban areas ('reurbanisation') has led to increasingaggregated cycling volumes in urban areas, and falling rates in rural areas. Second, the general mode share of cycling is mainly sensitive to changes in the composition of the population, especially elderly persons (higher rates) and immigrants (lower rates). Third, although per capita changes are minor, cycling shares among young adults living in urban areas and elderly baby boomers are growing.

Performance of cycling policies
We collected metadata from Statistics Netherlands and the Dutch Cyclists' Union, and complemented these by information based on a survey among policy makers. We applied an explorative, data-mining methodology called Rough Set Analyses (RSA) to analyse the data and to derive conditions of success for Dutch cycling policy.Our findings revealed that the performance of cycling policy correlates with a combination of the following conditions of success. First of all the organization and implementation of cycling policy seems important, especially having goals which can be measured and monitored, a successful implementation of most of the proposed policy interventions, having scope for experimental measures and strong leadership. Secondly, in addition and in combination with the above, providing infrastructure for cycling and decreasing attractiveness of car use (e.g. by increasing parking tariffs and enlarging the area of paid on-street car parking) seems to be important as well. Finally, the research outcomes show that success is also partly influenced by external circumstances, such as demographic trends.

Implications
The research results emphasize the need for a differentiated approach to promoting cycling and developing policies that can respond to location- and group-specific threats and opportunities. Regarding policy efforts our results imply that there is no simple recipe for designing effective cycling policy (or in other words: there is no 'silver bullet') and that policy effectiveness depends on a combination of various conditions. Additional research is needed to further clarify the drivers behind the observed trends and to fine-tune the policy strategies.